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NOTE BY THE SECRETARY-GENERAL

The Secretary-General has the honour to transmit to the members of the Security Council the attached communication which he has received from the Director-General of the International Atomic Energy Agency (IAEA).

## Annex

### Letter dated 10 March 1993 from the Director-General of the International Atomic Energy Agency addressed to the Secretary-General

Please find attached the report of the seventeenth IAEA Inspection in Iraq, under Security Council resolution 687 (1991). You may deem it appropriate to transmit the report to the members of the Security Council. I remain, of course, available with the Chief Inspector, Professor Maurizio Zifferero, for any consultations you or the Council may wish to have.

(Signed) Hans BLIX

REPORT ON THE SEVENTEENTH IAEA ON-SITE INSPECTION IN IRAQ
UNDER SECURITY COUNCIL RESOLUTION 687 (1991)

25 - 31 January 1993

## INTRODUCTION

1. This report summarizes the results of the seventeenth inspection mission carried out in Iraq by the IAEA under United Nations Security Council resolution 687 (1991) with the assistance and co-operation of the Special Commission of the United Nations. The mission took place from 25 to 31 January 1993 and was headed by Professor Maurizio Zifferero of the IAEA as Chief Inspector. The team consisted of 8 inspectors (comprising 8 nationalities) and support staff.

2. The objectives of the mission were broadly:

- follow-up activities concerning the inventory of material, equipment and machine tools relevant to the revised Annex 3 of the plan for ongoing monitoring and verification of Iraq's compliance with paragraph 12 of part C of United Nations Security Council resolution 687 (1991) and with the requirements of paragraphs 3 and 5 of resolution 707 (1991) (the long term monitoring plan). A particularly important task assigned to the IAEA-17 team was a review of the inventory of machine tools under Agency seal at the Al Rabiya factory, following the 17 January cruise missile attack;

- follow-up activities on nuclear material stored in the IRT building (Tuwaitha) and in locations B and C including the verification of Agency seals. Inspections at the Al Jezira uranium waste pond and Tarmiya uranium solution tanks were also planned;

- carry out short notice inspections at selected sites for checking seals and verify the utilization of key machine tools;

- obtain the long promised update of Annex 3. This is one of the prerequisites for detailed planning of the long term monitoring; take up again the important outstanding issue of information on source and procurement of key material, centrifuge components and other United Nations Security Council resolution 687 related equipment.

3. A total of 10 facilities and sites were inspected. These are listed in Table 1.

4. No new sites were designated this time for inspection by the United Nations Special Commission (UNSCOM).

**ACTIVITIES RELATED TO MATERIALS, EQUIPMENT AND MACHINE TOOLS**

5. Ash Shakyli warehouse 13b - Information received from a Member State indicated the export to Iraq of two Arburg jet moulding machines supplied with application specific fixtures for the manufacture of the hysteresis stator block of gas centrifuge motors[1]. The IAEA inspection teams had repeatedly questioned Iraqi officials regarding the presence in Iraq of machines for the manufacture of centrifuge motors. The Iraqi authorities had consistently stated that attempts to acquire "potting" machines were made but were unsuccessful because of the embargo and that the only motor stator manufactured in Iraq had been made by casting the epoxy by hand. An Arburg machine was discovered in the Ash Shakyli warehouse in the course of the fifteenth IAEA inspection mission (November 1992). After extensive questioning by the IAEA-17 team, the Iraqi authorities acknowledged that this machine had been acquired for the manufacturing of centrifuge motor stators, but stood firm on their story that the stator had been "potted" by hand. They indicated that they had no knowledge of a second Arburg machine in Iraq. They further stated that the application specific fixture had been broken and lost. IAEA inspectors of the seventeenth team have recorded manufacturer and technical specifications of the Arburg jet moulding machine and have applied Agency seals. Iraqi authorities have been asked to make an investigation on the second missing machine. Information received by the Action Team subsequent to the conclusion of IAEA-17 indicates that the second Arburg machine may have been obtained by the Iraqi side for their missile programme. This is a follow-up item for IAEA-18.

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[1]/ The completed stator block is then held in place in the bottom end flange by the addition of epoxy resin in a second operation ("potting").

Table 1

**List of facilities and sites inspected during the seventeenth inspection mission**

**List of Sites - IAEA-17**

1. Tuwaitha
2. Taji - Nassr State Establishment
3. Tarmiya
4. Al Jezira
5. Al Hatteen
6. Ash Shakyli
7. Al Rabiya (Al Nida)
8. Al Dijla (Al Zaura)
9. Location B
10. Location C

6. Procurement data from a Member State Government indicated 178 mixer-settler units (MSU) of various sizes, manufactured by Metallextraktion AB (MEAB), had been exported to Iraq. Batteries of mixer-settlers comprising several units per battery find extensive application in nuclear technology as solvent extraction contactors in uranium and plutonium recovery and purification. A full inventory of MSU's stored in the original shipping crates at Ash Shakyli was taken in the course of the fourteenth inspection mission in September 1992. This inventory of 70 units was again verified by the seventeenth inspection team and the request was reiterated with the Iraqi side to locate and present the remaining units.

7. The Iraqi side indicated that in conjunction with their effort to complete the Annex 3 declarations required under the Agency's long term monitoring plan, they searched for and found sheets of tantalum metal. The metal had been moved to Ash Shakyli Warehouse 13b where it was presented to the inspection team. The fifteen sheets of tantalum are of a size such that the material is a controllable item under Annex 3. Samples were taken for analysis.

8. The stock of master-slave manipulators which had been stored in a sealed condition at two locations in the Tuwaitha area were moved to Ash Shakyli 13b at the team's request. This is part of a more general effort to collect all reactor related components and spare parts at this location. All fifteen manipulators now at 13b are characterized and sealed.

9. Al Rabiya - The Al Rabiya mechanical workshop facility (a.k.a. Al Rabee and now called Al Nida) at Zaafaraniya, in the southern part of Baghdad was targeted and largely destroyed by a cruise missile attack on 17 January 1993. Prior to the Gulf War the Al Rabiya facility, together with the neighboring Al Dijla plant, were being developed to provide mechanical and electronics production support to the set of nuclear related activities organized under the code name Petrochemical 3 (PC-3). Documents removed from Iraq during the sixth IAEA inspection and statements made by the Iraqi authorities clearly implicate the Al Rabiya and the Al Dijla facilities in the manufacture of EMIS components. These documents also suggest that the Al Rabiya facility would have had a manufacturing role in the Iraqi gas diffusion uranium enrichment programme if this effort had evolved beyond the apparently unsuccessful diffusion barrier development work. The facility was not damaged during the Gulf

War. Following the war, according to Iraqi statements, the Al Rabiya plant was expanded with the addition of a number of technical buildings located immediately to the east (see Figure 1) and reorganized under the management of the Military Industry Commission (MIC) to support the reconstruction effort in Iraq.

10. Prior to the seventeenth mission, the Al Rabiya facility had been inspected three times by IAEA inspection teams (second, eleventh and fifteenth missions). Al Rabiya was judged to be a modern mechanical workshop facility with a good machine tool inventory and supporting capabilities in material preparation, chemical cleaning and quality control. There was no indication that the facility had been involved in PC-3 related activities after the Gulf War. During the fifteenth mission (November 1992) the Al Rabiya facility was visited as part of a more general effort to update the inventory of machine tools and other important equipment in the Iraqi State Establishments. At that time the Iraqi side was in the process of committing sizable resources to the further development of the site. Their explanation was that the Al Rabiya facility was an important part of the MIC plan for the reconstruction and industrialization of the country. The equipment inventory (primarily machine tools) had increased substantially since previous inspections: the number of workers had doubled and a new administration and planning building was under construction just to the west of building 24 (see Figure 1).

11. The visit to the Al Rabiya facility by the seventeenth IAEA inspection team was carried out on 27 January 1993, just ten days after the bombardment. The Director General of the facility met the team at the front gate and provided escort throughout the visit. The Iraqi side is cleaning up and rebuilding the site with determination to put it back in business within a few months. Thousands of people and hundreds of pieces of heavy equipment are committed on an around the clock basis. Large flood lights were in evidence throughout the facility. A large open field just to the west of the plant was rapidly being filled with rubble. The Iraqi side is literally removing rubble from one side of a building while they are re-building walls on the other side.

12. Six buildings were totally destroyed and another, building 24, was badly damaged. The destroyed buildings are indicated in Figure 1. With the exception of building 53, all buildings with a technical or production function were hit. Large buildings housing utilities, a raw materials store, the cafeteria and administrative offices were unscathed. None of the smaller support buildings were hit although most suffered some collateral damage. The Iraqi side spoke of several missiles that had gone

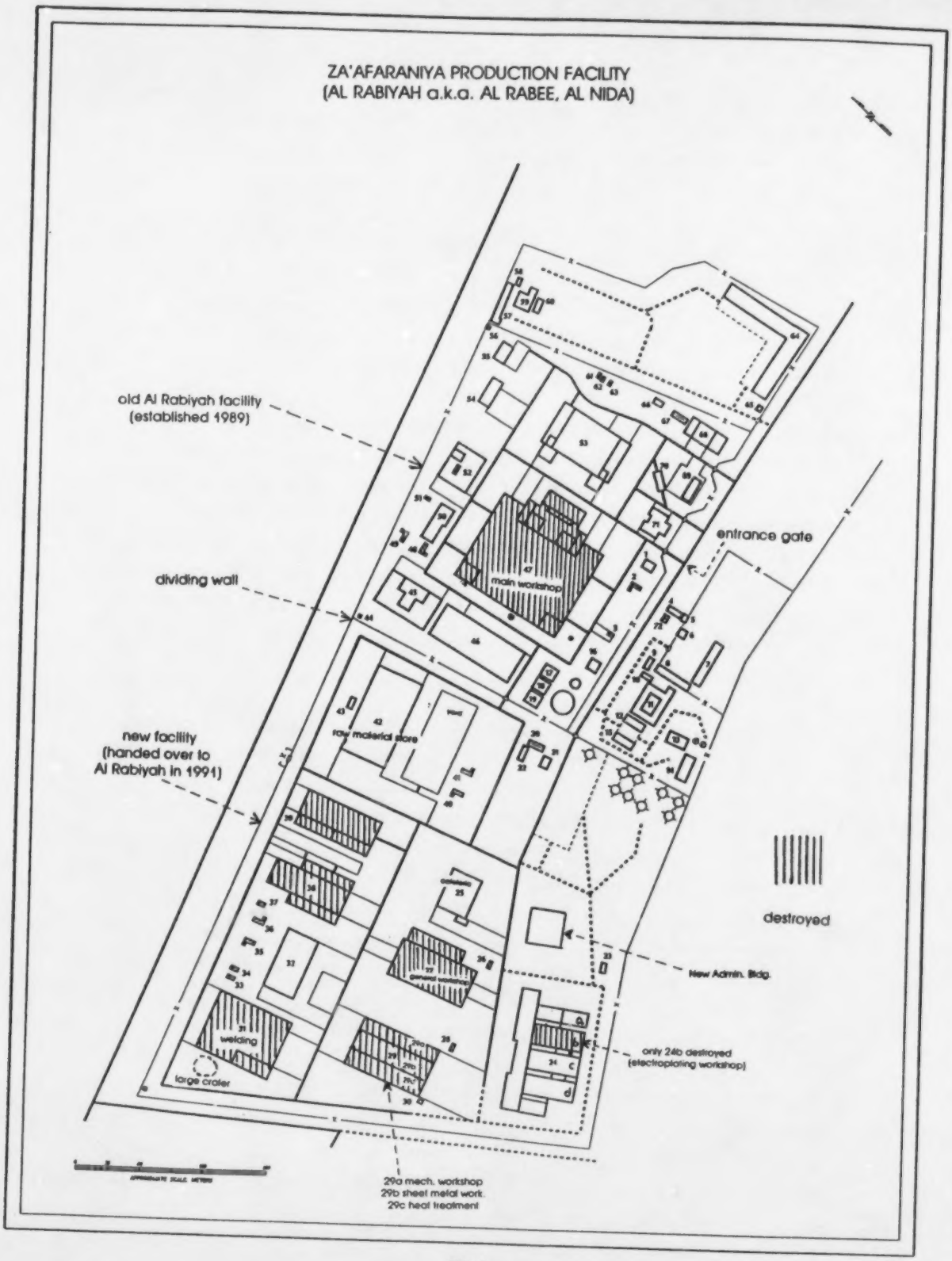
ZA'AFARANIYA PRODUCTION FACILITY
(AL RABIYAH a.k.a. AL RABEE, AL NIDA)
old Al Rabiyah facility
(established 1989)
dividing wall
new facility
(handed over to
Al Rabiyah in 1991)
entrance gate
main workshop
raw material store
destroyed
New Admin. Bldg.
only 24b destroyed
(electroplating workshop)
welding
large crater
29a mech. workshop
29b sheet metal work.
29c heat treatment

FIG. 1

astray and landed in residential areas but the 35 or so missiles (Iraqi estimate) that arrived at the Al Rabiya site appeared to hit their targets with nearly perfect precision. The only evidence on the site of a missile missing its target was a single large crater just to the east of building 31. The Iraqi side was vague regarding casualties at the site but apparently the number, if any, was low. There must have been a general evacuation of state establishments in anticipation of an attack.

13. The machine tools inventory at Al Rabiya, as updated in November 1992, contained 86 items. Eighty were judged to be general purpose and these included 63 milling machines, 7 coordinate measuring machines, 5 electric discharge machines, 3 jig bores, 1 jig grinder and 1 laser cutter. The remaining 6 machines - 3 Series-2 Matrix Churchill turning machines, 1 Series-3 Matrix Churchill turning machine, 1 Dörries turning machine (VTL with 2.5 meter table) and 1 Sciaky electron beam welder - were judged to be dual use and subject to control under Annex 3 of the long term monitoring plan. These items had been sealed. Most equipment was damaged or destroyed. A general updating of the equipment inventory was not possible and the inspection team concentrated on accounting for the dual use equipment. The Dörries and 2 Matrix Churchill (the Series-3 and 1 Series-2) turning machines were destroyed. The remaining 2 Series-2 Matrix Churchill turning machines were damaged but judged repairable and the seals were left in place. The Sciaky electron beam welder (located in building 53) was undamaged.

14. Throughout the inspection of the Al Rabiya facility, the very large work force went about their work. No show of hostility could be observed.

15. Al Dijjla - A brief inspection was carried out at the Al Dijjla plant (now called Al Zaura) which is located in the proximity of Al Rabiya. Many of the machine tools destroyed or damaged in the bombardment of Al Rabiya had been moved to the Al Dijjla site for repair work or salvage. Four general purpose machine tools declared by the Iraqi officials to have been used at Tuwaitha for manufacture of graphite components for EMIS separators were shown to the team. These machine are heavily damaged and unlikely to be brought back into working condition.

16. Taji - Nassr State Establishment (Fig. 2) - The intent of this visit was to conduct a short notice inspection of the current utilization of Taji machine tools/flow forming machines. The flow forming machines are located in building 159 and most of the more capable machine tools are in building 293. These buildings were the focus of the inspection.

As the team was proceeding toward Tarmiya, notification of the intent to inspect Taji was given about 10 minutes before passing by the facility. Once inside, the team split with one part proceeding to building 159 and the other to building 293. From the time of notification it was 30 - 35 minutes before the designated buildings were entered by the team. The earlier than necessary notification, a delay in gaining access at the front gate and the walk from the bus to the buildings all cost time. A time interval from notification to the beginning of the inspection of 15 minutes is easily achievable.

Most machines had been removed from the buildings prior to the recent hostilities and were being returned at the time of the inspection. Four of the flow forming machines were being re-assembled and the Agency seals were still in place. The three remaining machines had not been returned from the location where they had been taken for safe keeping during the hostilities. The side of the hall opposite the machines was stacked with crates containing flow forming pre-forms (~ 28 cm in diameter). The Iraqi side indicated that the pre-forms (declared to be 25% chromium, 4% moly steel) were for the manufacture of rocket casings (ABABIL 100s with a range up to 50 km). The ballistics team has examined them in detail.

A similar situation was encountered in building 293, but the process of returning the machines was further along. Only two machines - one dual use and one general purpose - had yet to be returned. Two seals had been broken during the removal and they were replaced. All others, with the exception of the single dual use machine yet to be returned, were accounted for. The few machines that were operating were producing pieces of artillery shells.

The Iraqi side was very secretive about the circumstances of removal or where they had been taken. After prolonged discussion with the team and consultation amongst themselves, the Iraqi side finally agreed to take two members of the team (the Chief Inspector and the team expert on machine tools) to the location where the four missing dual use machines were being stored. The planned inspection activities for the day continued and early the next day the two inspectors were taken to see the four missing machines. Overnight two of the machines had been returned to Taji (one flow forming and one machine tool). The other two (two flow forming machines) were still at the location where they had been taken during the hostilities. All machines and seals were accounted for.

Taji
Steel Fabrication Plant Nassr

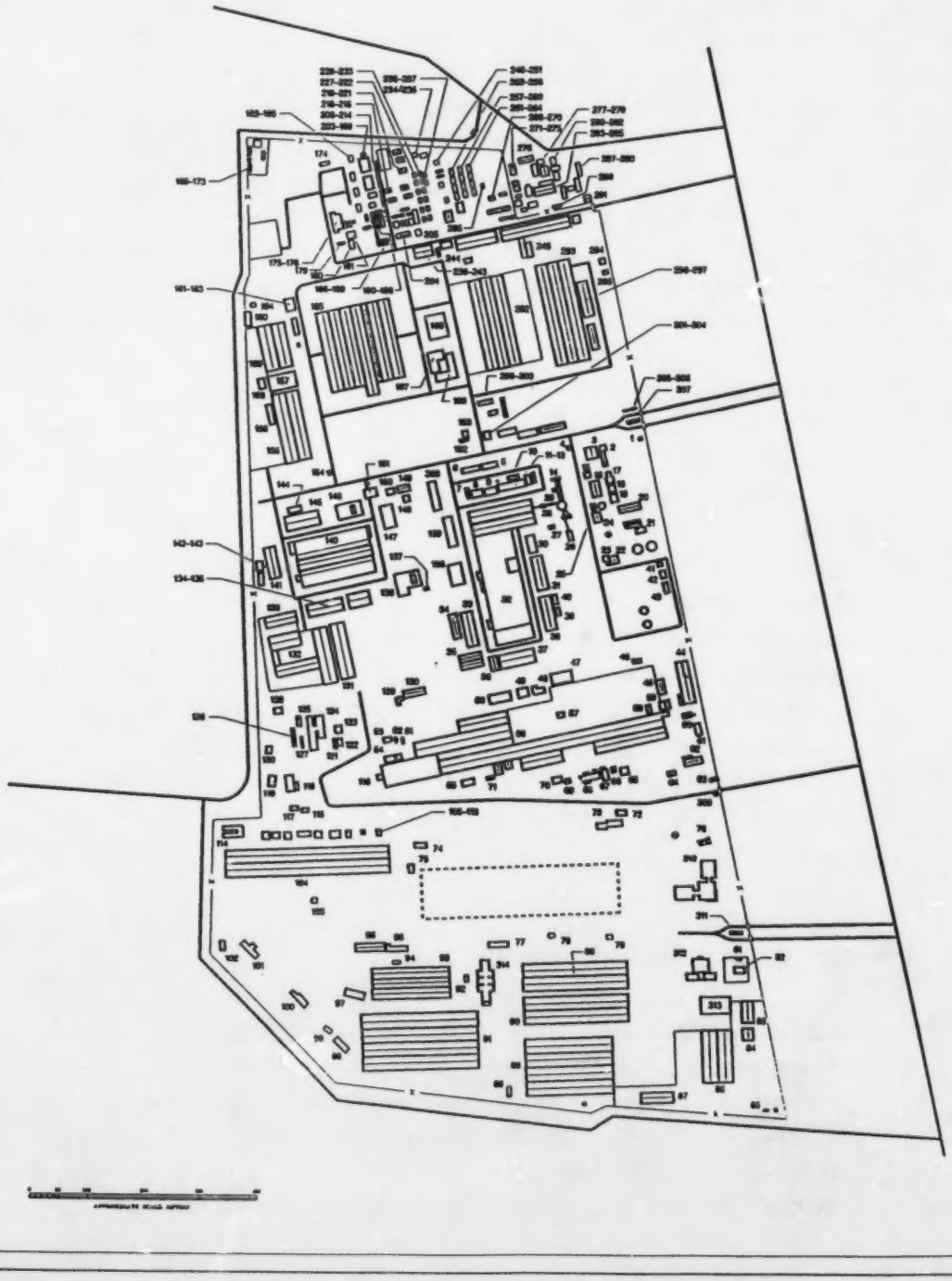

Fig. 2

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17. Tarmiya (Fig. 3) - The inspection at Tarmiya began, as usual, with a meeting with the Director General. He indicated that they had been requested by the Military Industrial Commission (MIC) to establish an industrial chemistry centre at Tarmiya. The mandate of the group is to provide consultations, chemical analysis, R&D and process development, possibly up to the pilot plant level of operation. It was further indicated that they were preparing a detailed proposal that will be ready by the time of the next inspection. The Iraqi side requested the release of some pieces of equipment from the general utilities building (building 38). Specifically they requested the release of 6 water recirculating pump and 3 cooling tower units. They indicated that the equipment was to be utilized at a steel rolling mill at Taji. A decision regarding the release of this equipment will be taken in consultation with the Special Commission. There have been a few changes at Tarmiya since the last inspection. Most equipment located in buildings 225, 47 and 57 have been moved to two more secure storage areas - the receiving area in front of building 57 and a warehouse located between buildings 38 and 277. They plan to begin preparing building 47 to support some of the industrial chemistry work described above.

18. Al Hatteen - During the course of IAEA-15, a sample of aluminum from a store at Al Hatteen was given to the Inspection team. Analysis of the sample indicated that, depending upon the configuration, the material may be controllable under Annex 3 of the long term monitoring plan. The purpose of the visit was to assess the materials configuration, the size of the inventory and to take additional samples. The Iraqi side declared 500 tonnes of rods (120 mm x 3 m) and 2800 rods (150 mm x 3 m). They further declared that the rods would be used to manufacture the lower part of 156 mm artillery shells. The inventory was verified and samples from each diameter rod were taken.

**ACTIVITIES RELATED TO NUCLEAR MATERIALS**

19. Tuwaitha, Location B, Location C - The irradiated fuel assemblies stored in the IRT-5000 reactor pool and adjacent storage pond at Tuwaitha has been verified by item counting. Seals were checked in Location B where additional irradiated fuel assemblies are stored. Winter rains have converted Location B into a quagmire preventing the access of lifting equipment and tank trucks needed to adjust, if necessary, the water level inside the sealed containers. External radiation

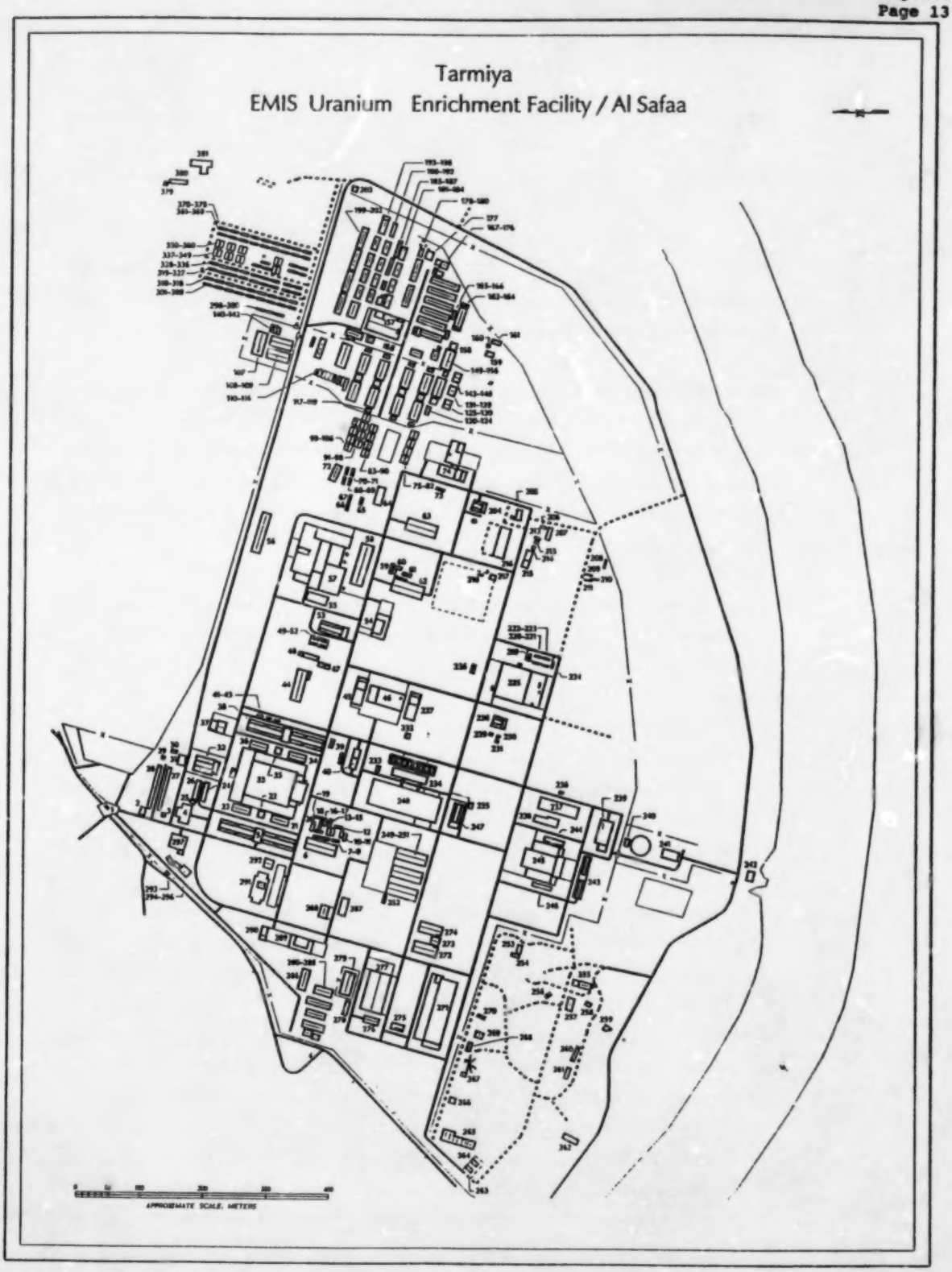
Tarmiya
EMIS Uranium Enrichment Facility / Al Safaa
APPROXIMATE SCALE, METERS

Fig. 3

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measurements indicated that there is no immediate problem. Seals were also checked at Location C where the bulk of Iraqi natural uranium stock is stored and in several Tuwaitha buildings where hot cells are located. All seals were found undisturbed.

20. Al Jezira - In the course of the fifteenth IAEA inspection the Iraqi authorities had agreed to take a series of action at the Al Jezira plant site. The seventeenth IAEA inspection was to follow-up on the requested actions.

There have been a few changes at the site. The new administration building (the building was in an early stage of construction at the time of IAEA-15) has been completed and is now occupied. It is immediately on the up-hill side of the old building. Construction of the small office building adjacent to the quality control laboratory has not advanced much. The level of activity in the small quality control laboratory is negligible.

There has been little progress made in completing the agreed upon actions. The Iraqi side indicated that poor weather conditions has slowed things down. A summary follows:

- The evaporation of the low concentration uranium waste in two of the large settling tanks has been slowed by a layer of kerosene that effectively seals the surface. In the second tank which still contains some slurry, the Iraqi side has pumped the lighter material on the surface in the first tank in an attempt to speed the process. Any recovery must still wait for warmer, dryer weather;

- Uranium bearing organic solutions and filters could not be removed as requested from Location 6 because this location is not accessible to trucks because of wet conditions. The removal will take place when things dry out;

- The drums containing solid waste stored in the garage adjacent to the settling tanks have been moved, in mass, to the bottom of the near end of the third tank. The whole mess will be entombed in concrete with improving weather;

- Little has been done with respect to the actions involving the $UCl_4$ and $UO_2$ building sites. The Iraqi side are busy scavenging large quantities of buried electrical cable. They reiterated the agreement to collapse the still standing

portions of buildings at the $UO_2$ site, fence off both areas and simply abandon them.

The Iraqi authorities again stated their intention of turning this site into a centre for the development of processes for the recovery of minerals from indigenous ores. A detailed formal proposal will be made available by the time of the next inspection.

**OTHER ACTIVITIES**

21. The IAEA has been pressing the issue of procurement-related information since the beginning of inspection activities under resolution 687 with little success. On 7 December 1992 at a meeting with Dr. Human Abdel Khaliq Ghaffour, Minister of Higher Education and Scientific Research and Chairman of the Iraqi Atomic Energy Commission (IAEC), assurance was given in writing to the Chief Inspector of IAEA-16 that procurement-related questions would have been "dealt with positively". The statement of Dr. Ghaffour had led the Agency to follow-up with a letter requesting specific information regarding the sources of maraging steel. The reply to this letter failed to provide the requested information. Details of this meeting and a copy of the exchange of correspondence were included in the sixteenth inspection report[2].

This issue was taken up again in meetings held with the counterpart during the seventeenth inspection. The Iraqi side explained that it was their intention to close once and for all the chapter of procurement and to provide the information that is still missing, but they wanted a consolidated list of still outstanding questions on procurement by IAEA and UNSCOM and this list, as complete as possible, should only refer to resolution 687 related items. Answers would have been provided in writing and the matter would be settled. This procedure was objected to by the Chief Inspector as experience has shown that answers provided by the Iraqi team normally generate further questions. The whole issue of procurement-related information will be taken up again in the next inspection.

22. The Iraqi side agreed to the IAEA-17 team request to begin consolidating the storage of reactor components and spare parts (electronics, heat exchangers, pumps). It was agreed to utilize the Ash Shakyli warehouse 13b for this purpose.

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[2]/ GOV/INF 678 or S/25013

23. On the last inspection day the Iraqi side handed to the team the list of items of the revised Annex 3 of the long term monitoring plan. The Iraqi counterpart stated that this list now covers, as requested, the period from first of January 1989 and included all Annex 3 items which exist or existed in IAEC facilities, universities and State Establishments which supported the IAEC programme. The Iraqi counterpart indicated that the list covered their current knowledges regarding the existence of controllable items in the whole of Iraq. However, they reserved the right to include items which might have escaped the census or had not been identified as belonging to the Annex 3 in the next update to the list which falls due on July 1993.

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